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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,468	07/09/2001	Joe Cargnelli	9351-62	4144

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10/07/2003
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EXAMINER

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 10/07/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/900,468

Applicant(s)

CARGNELLI ET AL.

Examiner

Wills M Monique

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement(s) filed November 28, 2001 and February 9, 2003 has/have been received and complies with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 .

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms "GE noryl" and "EN265" are of uncertain meaning rendering the claims vague and indefinite. It is unclear as to what type of polymer materials these refer to. Further, the trademark should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10 & 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Spear, Jr. et al. U.S. Patent 5,863,671.

Spear teaches a fluid management core assembly comprising a plurality of thin plates, preferably of non-conductive plastic, ceramic or other suitable material into which numerous intricate microgroove fluid distribution channels have been formed, preferably by compression molding, but also by injection molding, laser ablation or cutting, embossing, solvent etching, pressing, stamping or other pressure processes that create through-and-partial-depth features (col. 3, lines 39-46). Adjacent plates, each having coordinate partial depth features, upon bonding provide gas, coolant and vapor distribution channels. Combinations of these features create flow fields and manifolds. See column 3, lines 45-56. After the platelets are formed, they are lamination bonded together by any suitable combination of adhesive, heat and/or pressure (col. 4, lines 40-45). FIG. 4A illustrates a single cell fluid flow circuit schematic for integrated humidity and thermal management IFM separators. The schematic clearly shows the integration of seven fluid management devices into a

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single bonded composite separator. The seven unctons are the cathode humidification water serpentine channel D10 flow field, hydrogen humidification serpentine channel D18 flow field, anode active area serpentine channel D21 flow field, anode humidification water serpentine channel D14, cooling water serpentine channel D6 heat exchanger, cathode humidification serpentine channel D26 flow field, and cathode active area serpentine channel D29 flow field. These functions are connected using a series of internal manifolds. See col. 15, lines 5-26. Dry hydrogen gas enters the hydrogen inlet D16, flows through internal manifolds and feed circuits to the anode humidification serpentine channel inlet D17, flows through the anode humidification serpentine channel D18 picking up water vapor (becoming hydrated), flows out the anode humidification serpentine channel exit D19, through internal collection and distribution manifolds to the anode active area serpentine channel inlets D20, passes through the anode active area serpentine channels D21 where the hydrogen is oxidized to produce protons and electrons, leaves the active area through the anode active area serpentine channel exits D22, flowing through internal collection manifold finally exiting as depleted hydrogen through the hydrogen exit D23. See column 15, lines 59-68 and col. 16, lines 1-5. Dry air (oxygen) gas enters the air (oxygen) inlet D24, flows through internal manifolds and feed circuits to the cathode humidification serpentine channel inlet D25, flows through the cathode humidification serpentine channel D26 picking up water vapor (becoming hydrated), flows out the cathode humidification serpentine channel exit D27, through internal collection and

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distribution manifolds to the cathode active area serpentine channel inlets D28, passes through the cathode active area serpentine channels D29 where the air (oxygen) is reduced by electrons and protons to produce product water, leaves the active area through the cathode active area serpentine channel exits D30, flowing through internal collection manifold and finally exiting as depleted air (oxygen) and product water through the air (oxygen) exit D31. See column 16, lines 5-20. Cooling and humidification water enters the cooling water inlet D4, flows through internal manifolds to the cooling water serpentine channel inlet D5, flows through the cooling water serpentine channel picking up heat produced as by product of the electrochemical reactions, flows out the cooling water serpentine channel exit D7, into internal manifolds, to the humidification water inlet manifold junction D8, feeding the two humidification water circuits. Hot water from the humidification water inlet manifold junction D8 flows through internal manifolds to the cathode humidification water serpentine channel inlet D9, flows into the cathode humidification water serpentine channel D10 with a small portion osmotically pumped across the electrolytic membrane D2 to humidify cathode air (oxygen), flows out the cathode humidification water serpentine channel exit D11, through internal manifolds finally exiting through the cooling water outlet D12. See column 16, lines 20-36. Each platelet contains hydrogen outlet manifolds, hydrogen inlet manifolds, water inlet manifolds, water outlet manifolds, air outlet manifolds and air inlet manifolds (col. 33, lines 60-65). The number of platelets employed in the fuel cell stack range from 3-10

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plates, and preferably 4-7 (col. 4, lines 5-10). Therefore, the instant claims are anticipated by Spear.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1-3 & 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Hatoh et al. U.S. Patent 6,361,236.

Hatoh teaches, as illustrated in Fig. 2, a plurality of first ports 8a and 8b and a plurality of second ports 8a' and 8b' and a plurality of fluid passages 12 and 12' providing communication between first and second ports. A plurality of layers 4a, 4b and 4c are provided each having a plurality of ports and fluid passages providing fluid communication between the ports. The system also comprises a first plate layer 4a, a second plate layer 4c and a third plate layer 4b interposed therebetween. Each layer provides a plurality of respective ports and fluid passages connecting therebetween.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spear, Jr. et al. U.S. Patent 5,863,671 as applied to claim 1 above, in view of Applicant's disclosure.

Spear teaches that the manifold platelet may be constructed of polymeric materials include polycarbonate, polyamide, polystyrene, polypropylene, PVC, nylon, or copolymers, terpolymers, or the like.

The reference is silent to polymeric materials comprising GE noryl and EN265.

Applicant asserts at paragraph 68, that GE noryl and EN265 are readily available, cheap materials with adequate heat durability or fluid resistance.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the polymeric materials of the instant invention, because said polymers are readily available, cheap materials with adequate heat durability and fluid resistance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spear, Jr. et al. U.S. Patent 5,863,671 as applied to claims 13 above, in view of Landau et al. U.S. Patent 5,023,151.

Spear teaches a platelet manifold comprising a plurality of fuel, oxidant and coolant ports communicated through flow passages as described hereinabove. Further, teaching a cooling water for thermal management entering through water inlet manifold G9, flows through an heat exchanger and leaves through the water outlet manifold G8.

The reference is silent to two heat exchangers employed in the coolant loop.

Landau teaches that it is conventional to employ a heat exchanger to transfer heat from a recirculating coolant to a waste heat fluid. And in order to more effectively control the return fluid to the fuel cell, a second heat exchanger is provided which removes additional heat as required to maintain the desired inlet temperature to the fuel cell. See column 1, lines 28-40.

Therefore, it would have been obvious to one of ordinary skill in the art the time the invention was made to employ two heat exchangers in the cooling loop of Spear, in order maintain the desired inlet temperature of the coolant into the fuel cell.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spear, Jr. et al. U.S. Patent 5,863,671 as applied to claims 1 & 13 above, in view of Nolscher et al. U.S. Patent 6,162,554 and further in view of DuBose U.S. Patent 6,013,385.

Spear teaches a platelet manifold comprising a plurality of fuel, oxidant and coolant ports communicated through flow passages as described hereinabove.

The reference is silent to oxidant and fuel gas heat exchangers, and oxidant and fuel gas humidifiers.

DuBose teaches a method and apparatus for the management and control of various flow streams related to the operation of a fuel cell (col. 1, lines 10-15). In order to maintain proper operating conditions for the fuel cell, the temperature and humidities of the anode and cathode circuits must be precisely controlled to avoid drying out of the electrolyte or otherwise damaging the fuel cell, and thereby stopping the flow of electricity from the fuel cell (col. 1, lines 50-55). This is achieved by employing humidifiers in the anode and cathode circuits (col. 2, lines 37-45).

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Nolscher teaches the use of oxidant and fuel heat exchangers to make the enthalpy contained in the exhaust gases usable increasing the overall efficiency of energy conversion in the fuel cell system (col. 1, lines 30-50).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ oxidant and fuel gas humidifiers in the anode and cathode circuits of Spear, in order to maintained proper operating conditions of the fuel cell and avoid drying of the electrolyte or otherwise damaging the fuel cell as taught by DuBose.

Regarding the oxidant and fuel gas heat exchangers, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ said heat exchanger arrangement in the fuel cell of Spears, in order to increase the overall efficiency of energy conversion in the fuel cell system, as taught by Nolscher.

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Conclusions

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (703) 305-0073. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

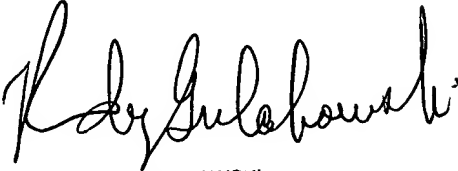
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 703-308-4333.

The unofficial fax number is (703) 305-3599. The Official fax number for non-final amendments is 703-872-9310. The Official fax number for after final amendments is 703-872-9311.

Mw

09/20/03


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